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ENTERPRISE CONTENT MANAGEMENT SYSTEM IMPLEMENTATION READINESS TO IMPROVE MEDICAL RECORDS MANAGEMENT IN LIMPOPO PROVINCE, SOUTH AFRICA

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Abstract

This study sought to establish readiness for implementation of ECM to improve medical records management in the public hospitals of the Limpopo Province in South Africa. The use of digital systems such as enterprise content management (ECM) to manage medical records is fundamental to ensure timely access, sharing and use of the medical records by healthcare providers and hospital management. This is because timely access to medical records will result in timely healthcare service delivery to the patients. There have been many different kinds of digital systems applied in different organisations for different categories of records throughout the world. Quantitative data were collected through questionnaires directed to the Records Management Units at the public hospitals in the Limpopo Province of South Africa supported with observation and document/system analysis. The study reveals that the hospitals in the Limpopo Province had not yet implemented ECM as a system and had limited IT resources like computers, printers, servers, network points and internet access. This study appears to be the first of its nature to investigate the readiness of the hospitals in Limpopo province of South Africa for implementation of enterprise content management system. The study recommends that ECM be implemented to improve medical records management in the public hospitals of Limpopo since the hospitals had no effective systems for proper management of medical records.

Key words- Medical records management, Enterprise content management, Electronic records management, Healthcare Service, Limpopo Province, South Africa

Introduction

Implementation of ECM in the public hospitals appears to be fundamental in ensuring improved medical records management. The quality, timely, trustworthy and reliable knowledge or information may only be produced through the use of proper records management models supported with an effective electronic records management system such as Enterprise Content Management (ECM) system or electronic health records (EHR) system (Harries, 2008; Kumar, 2011; Weeks, 2013). Transformation of the enterprise records management with ECM may bring about more improvement in different spheres of business including satisfactory services to customers, processes streamlining, employees productivity enhancement, information tracking, regulation compliance, useless information elimination in storages, and measurable business continuity. Nevertheless, there are several things to consider when transforming to ECM, such as identification of needs, cultural types, kind of data produced, resources related to ECM (Hullavarad, O'Hare and Roy 2015:1; Salamntu and Seymour 2015:32-33). The Association for Information and Image Management (AIIM) (2010) define ECM as "a dynamic combination of strategies, methods, and tools used to capture, manage, store, preserve, and deliver information supporting key organizational processes through its entire lifecycle". In other words, it is a strategy that is made up with a set of software products to manage all types of enterprise content throughout its entire life cycle (Bell, Shegda, Gilber, and Chin, 2010; Katuu, 2012a; Salamntu and Seymour 2015:32; Hullavarad, O'Hare and Roy 2015:1).

ECM came into existence after frequent interchangeably use of the concepts Electronic Records Management System (ERMS) and Electronic Document Management System (EDMS) (Katuu, 2012a; Katuu, 2012b; Salamntu and Seymour 2015:31-32). EDMS was also known as the Document Imaging Management (DIM) System as it was a system to reproduce records into electronic format by scanning the hardcopy records for quick retrieval of records (Cvision Technologies, 2013 and Katuu, 2012a). The interchangeable use of the two concepts resulted in their combination to eventually form Electronic Record and Documents Management System (ERDMS) or Integrated Document Management Software or Systems (IDMS) (Katuu, 2012a). ECM emanated from migration of ERDMS into the web content and the introduction of improved add-ons such as web content management tools, e-mail integration and workflow/business process management to cover the application and development of EDRMS. It is a collective business processes management approach (Katuu, 2012a; Salamntu and Seymour 2015:32). It is more than just records management and document management, but it covers many other components including knowledge management (Katuu, 2012a; Salamntu and Seymour 2015:32).

Furthermore, Svärd (2013:160); Salamntu and Seymour (2015:31); Hullavarad, O'Hare and Roy (2015: 1); Alalwan and Weistroffer (2012) attest that ECM is the best tool to properly manage a large overload of unstructured and structured information for many organisations. It is an ideal solution for an organisation that creates a large volume of records in a short period of time. For instance, ECM system was implemented by the Western Cape Department of Health in South Africa and improved their Forensic Pathology Services and Oncology Unit at Tygerberg Hospital and Khayelitsha Hospital, and eventually after successful testing moved to implement the system for the entire Tygerberg Hospital in Bellville Cape Town (Weeks, 2013). However, looking at the background of the Limpopo Department of Health a large number of medical records are created every day when patients consult at different hospitals, but they do not have a collaborative system such as ECM to integrate the records management responsibility. This is because the electronic system used for patients' administration in the Limpopo public hospitals, known as Provincial Health Information System (PHIS) is not capable of tracking paper-based records movement or creation. It is also incapable of capturing medical history of the patients, but capture only personal details and billing data (Marutha, 2011; Marutha and Ngulube, 2012).

To support the above statement, the study by Mbananga, Madale and Becker (2002) revealed that "implementing a HIS is an enormous challenge for the health service. However, there was some evidence that HIS can improve some activities". Littlejohns, Wyatt and Garvican (2003: 862) attest that the other causes of these shortcomings was that initially there was a delay in the implementation of other important modules in the system. They further stated that the software or system features or functionalities were also too extensive to the extent that staff or users needed training and that contributed to delay in implementation of the overall system. There was also lack of attention to important aspects of the system like its reliability and capability to make printouts. The system left the users/staff dissatisfied and in its implementation basic functions were put forward as priority than key functionalities like reporting functions for management, which weakened support to decision makers. Other system challenges entails computer malfunctions, no access credentials to some users, delay in resolving computer malfunctions and system slow response. Some computers in the hospitals remained malfunctioned for up to six weeks sometimes. According to Littlejohns, Wyatt and Garvican (2003: 860-861) "each hospital would have its own server to manage all local data and distribute summary data on each patient encounter to other hospitals where the patient had been seen and to a central server at the Welfare and Health Information Technology Operations Centre in Pietersberg (now Polokwane)". Consequently, this study sought to establish implementation of ECM in the public hospitals of Limpopo Province in South Africa to remedy the situation.

Contextual setting

South African healthcare system has a very extensive history in its development. Before South Africa converted to democratic republic in 1994, healthcare system was racially fragmented into black majority and white majority. The system for the black majority was under-resourced and the white minority system was highly resourced (Katuu 2016:332; Schneider, Barron and Fonn 2007:291; South Africa Department of Health 2015: 5). These imbalances also affected physical infrastructure, human resources competencies, finances, and incompatible multi-healthcare systems (Schneider, Barron and Fonn 2007:291). The constitution then brought about socioeconomic rights and illegalisation of racial discriminations, which also brought in the rights of access to healthcare service. From 1994 the healthcare system was re-established into "single de-racialised" with the three levels of government, namely national, provincial and local government and operates at all these levels. This brought about healthcare service that is comprehensive. The intention was to ensure that healthcare system quality, access, efficiency and effectiveness is enhanced. After democratic government started some of the healthcare services were rendered free of charge at the primary healthcare centres and that led to an increase in the number of patients visit which relieved a little bit to the hospital visit. The government then started with healthcare facilities infrastructure development programme coupled with outreach programme that also aimed at bringing the healthcare services closer to people's residents, at least 5 kilometres radius. This was also supported with development and recruitment of healthcare professionals (South Africa Department of Health 2015: 5).

The public healthcare service in South Africa has being transformed substantially well since 1994 (Harrison 2009:2; Jobson 2015) in terms of several things related to health including management of burden of diseases that include HIV/AIDS, but that was derailed by poor healthcare system management and as a results lowered the quality of healthcare service (Harrison 2009:2). Schneider, Barron and Fonn (2007:290) also attest that "despite numerous initiatives to transform the South African health system, the reality is that… the system is as problematic as it was before 12 years ago". In an attempt to further fight burden of disease South Africa is also working towards the introduction of National Health Insurance (NHI) System as a form of funding strategy (Harrison 2009:33), with the intention to reduce rural and urban citizens inequalities when it comes to access to healthcare service (South African Department of Health 2015:4). NHI is not the focus of this study but its introduction will eventually lead to production of more medical related records that warrant proper keeping as well. For instance, South African Department of Health (2015:84) attests that

> "Establishing the NHI Fund will require the development of systems and processes to ensure its effective functioning and administration. These include the development of a provider

> payment system (DRG system), health patient registration system, health provider registration system and fraud and risk mitigation system".

On the other side, according to the South Africa Department of Health (2010:7) ehealth foundation, and monitoring and evaluation of the ehealth strategy are part of the strategic priorities to "strengthen healthcare transformation in South Africa". The department of health in South Africa also has a mission to ensure that as a central part of transforming and improving healthcare services they want to ensure that ehealth is established. This will help to lay a foundation to prepare the department to meet the requirements of ehealth in future (South Africa Department of Health 2010:8). South Africa Department of Health (2010:9-10) also attest that there are several challenges related to healthcare systems that still need to be addressed in the public healthcare sector of South Africa. These includes non-existance of ehealth strategy, inadequate ehealth strategy capacity and capabilities, ehealth maturity levels differs across provinces, disparate systems interoperability and communications, silos information in different governmental levels, inequity of ehealth services, expensive broadband connectivity, inappropriate cooperation and collaboration, poor planning and lack of understanding. Looking at the background for healthcare system initiatives:

> "As early as 1997, the NDoH published the White Paper for the Transformation of the Health System in South Africa. The White Paper advocated the establishment of a comprehensive national health information system with two components: • Management information and disease surveillance systems and Population health and demographic surveillance. Health services in South Africa are delivered across three levels of government: national, provincial and local. In terms of the South African Constitution, both national and provincial governments have concurrent jurisdiction over health as a service delivery area, i.e. both make decisions and have a duty to deliver services. In practice, the role of the NDoH focuses on legislation, policy, norms and standards, and ensuring equity, while the role of the provincial departments of health is focused on the planning, budgeting and delivery of health services at the coal face. Local government is responsible for the delivery of municipal health services as stipulated in the National Health Act No. 61 of 2003. The delivery of eHealth services in public sector facilities is the responsibility of the provincial departments of health. The responsibility for eHealth policy and strategy development resides with the NDoH. In terms of Section 74 of the National Health Act, the NDoH is responsible for the facilitation and coordination of health information. The Act stipulates that "the national department must facilitate and coordinate the establishment, implementation and maintenance by provincial departments, district health councils, municipalities and the private health sector of health information systems at national, provincial and local levels in order to create a comprehensive national health information system" (South Africa Department of Health 2010:10).

> "The Act empowers the National Minister of Health to "prescribe categories or kinds of data for submission and collection and the manner and format in which and by whom the data must be compiled or collated and must be submitted to the national department". The NDoH exercises its coordination and facilitation role through the National Health Information System of South Africa (NHIS/SA) committee. The NHIS/SA committee was established in 1994 with the broad objectives of: • Ensuring the availability of information for the management of health services. • Measuring the health status of the South African population. • Coordinating country-wide health information systems. The membership of the NHIS/SA committee consists of

> senior managers in the NDoH responsible for health information, monitoring and evaluation, epidemiology, and research; senior managers responsible for similar functions in the provinces, and invited representatives from partners and other organisations. The NHIS/SA committee meets quarterly and reports to the Director-General of the NDoH" (South Africa Department of Health 2010:11)

So far, improving the healthcare service in South Africa several things need to be improved including functional resources, adequate financing, and stewardship (Schneider, Barron, & Fonn 2007:289). South Africa is planning to implement the National Health Insurance (NHI) in phases as per the National Development Programme (NDP) provisions. It is hoped that the NHI will lower cost from private medical care, bring good quality healthcare service with capable human and systems (South Africa Department of Health 2015: 6). "It is imperative that South Africa implements NHI to achieve the goal of an integrated health care system that serves the needs of all, regardless of race, socio-economic status and ability to pay for services" (South Africa Department of Health 2015: 6).

> Globally, countries have been encouraged by the WHO to move towards Universal Health Coverage (UHC) 5. More recently, the United Nations adopted seventeen Sustainable Development Goals (SDGs). Goal 3.8 of the SDGs urges all countries to: Achieve universal health coverage including financial risk protection, access to quality essential health-care services and access to safe, effective, quality and affordable essential medicines and vaccines for all. South Africa's approach towards achieving UHC will be through the implementation of NHI. The conceptualisation and design of NHI will take into account the country's experiences and global lessons learnt in the development of universal health coverage (South Africa Department of Health 2015: 6)

Looking at the contextual setting of the area of the study, this study is focused on all the public hospitals attached to the Department of health in the Limpopo province of South Africa. South Africa is a country located in the far southern part of Africa between the Indian Ocean and Atlantic Ocean. It comprise of nine provinces, including Limpopo. Jobson (2015) attest that in South Africa

> "there are 4200 public health facilities in South Africa with each clinic providing on average for 13,718 persons (a figure that exceeds the WHO guidelines of 10,000 per clinic.) People averaged 2.5 visits per year to public health facilities and the bed occupancy rates were between 65% and 77% at hospitals. Since 1994, more than 1600 clinics have been built or upgraded. For 2,5 million South Africans, their nearest clinic is more than 5 kilometres away from their homes. There are 376 public hospitals in the country; 143 in urban areas and 233 in rural areas. Diagnostic and health research services are provided by the National Health Laboratory Service (NHLS), the largest pathology service in South Africa with 265 laboratories, serving 80% of South Africans".

The Limpopo province is located in the far north of the country close to most of the neighboring countries, namely, Mozambique, Malawi, Swaziland, Zimbabwe and Botswana. The department of health in the province renders healthcare service using 40 hospitals which is the focus of this study; and in addition many clinics, health centers and vertical programmes which are not the focus to this study.

Research problem

The use of manual mode of managing medical records in the healthcare institutions has been a dominant challenge that dismally affects easy management of records and timeous access during healthcare service delivery. In some instances the existing systems appears to be less functional in terms of file tracking and provision of the required information for business continuity. The specific problem that led to this study is that due to lack of integrative records management systems (Erasmus, 2013; Marutha, 2011; Marutha and Ngulube, 2012), such as ECM the healthcare institutions in the Limpopo Province experience difficulties to:-

- provide quality data for creating knowledge to support organisational decision making and problem solving (Anova Health Institute, 2012);
- timely retrieve and provide records for patients' healthcare services and citizen information request (Maponya, 2013; Marutha and Ngulube, 2012 and Monama, 2013); and
- improve the quality of healthcare service delivery. The process of rendering healthcare service depends on the knowledge for timeous improvement of performance or properly rendering of the service (Bordoloi and Islam, 2012).

The purpose of this study was to investigate readiness for implementation of enterprise content management to improve medical records management in the Limpopo Province of South Africa. The objective of the study was to assess the readiness for implementation of ECM at the hospitals of the Limpopo Province in South Africa. Specific objectives of this study were:

- To establish understanding of ECM in the public healthcare sector of Limpopo Province in South Africa.
- To find out the need for implementation of ECM in the public healthcare sector of Limpopo Province in South Africa.
- To investigate extent of availability of resources required for implementation of ECM in the public healthcare sector of Limpopo Province in South Africa.

Research methodology

This study used a quantitative approach with the questionnaire as an instrument for data collection. The target population in this study was staff in the records management unit in all the 40 public hospitals of the Limpopo Province in South Africa. The records management unit was purposively identified since it is assigned with the duty and responsibility for managing records and making sure the records are available, accessible, protected, reliable and authentic at all times. The Human Resource (HR) staff establishment helped to determine the sample frame. The sample frame was used

to stratify and randomly select employees from different post levels in the records management unit of each hospital per district, who eventually participated in this study (Powell and Connaway, 2004). In conducting this study, the total population identified was 622 from which a sample of 49% (306) was drawn using stratified simple random sampling method. The sample size confidential level was confirmed to be more than 95% and margin of error was 4% according to the Raosoft sample size calculator. The Raosoft sample size calculator also recommended sample size of 306 out of the total population of 622, to which the researcher adopted. Data was collected using the questionnaires, document/system assessment (e.g. policies and procedures) and observation of the state of records management and records management systems to accomplish empirical and epistemological outcomes by ensuring that these techniques close each other's weaknesses from its disadvantages by its diverse advantages (Mouton, 2002).

Literature review

It has being recognised since many years back in both public and private enterprise that records, especially digital records need to be managed systematically with the application of effective program or system (Katuu, 2015; Dollar and Ashley, 2013; Salamntu and Seymour 2015:34; Hullavarad, O'Hare and Roy 2015:1). Records management program or system that will ensure timely accessibility to digital records that are authentic and usable for the period that it will be required for among other reasons operational activities, regulatory and legal issues and kept as cultural memory of the organisation (Dollar and Ashley, 2013). Nevertheless, like management of other business activities that improves with the advancement of technology, records management techniques also change or improve as the technology becomes advanced (Salamntu and Seymour 2015:31). Salamntu and Seymour (2015:31) attest that "ECM is viewed as the final point in an evolutionary process, where other concepts such as EDMS and ERMS are the predecessors". The latest record management technology seems to be the ECM as illustrated by Katuu (2012a; 2015; 2012b; Kwatsha 2010; Salamntu and Seymour 2015:32; Katuu 2016:338). This is illustrated on Figure 1. The figure illustrates the development of various concepts or systems that eventually fashioned into ECM in 3 phases. The figure shows that at the 1st phase records were managed through the two systems known as EDMS and ERMS, at the 2nd phase records were managed using either IDRMS or EDRMS and at the 3rd phase everything were combined into ECM system. For instance, document management, records management, web content management, workflow or Business process management, collaboration, imaging, portals and knowledge managementmay be integrated into ECM (Katuu, 2012a; 2012b; 2015; Salamntu and Seymour 2015:32 Katuu 2016:338). "ECM offers robust functionality for systematic analysis and control of all information throughout its life cycle"

(Hullavarad, O'Hare and Roy 2015:1).

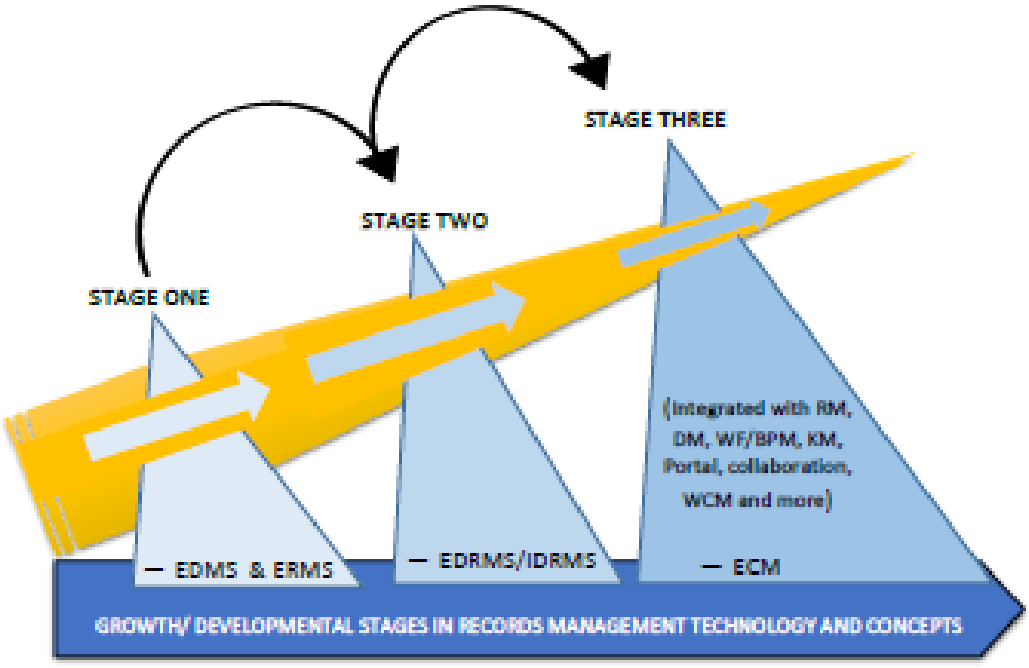

Figure 1: A typical illustration of the development of various technologies and formulation of new concepts until the last state of ECM

Furthermore, Fanning (2013) and Kampffmeyer (2006) define ECM as "the technologies used to capture, manage, store, preserve, and deliver content and documents related to organisational processes". This was also alluded to by Salamntu and Seymour (2015:32) and Hullavarad, O'Hare and Roy (2015:1); Svärd (2013:160); MacMillan and Huff (2009:4). ECM is made-up of a set of complex technologies integrated to function together with the purpose to ensure improvement in managing organisational business content successfully. Successful ECM system implementation brings about business contents that are easy to access and retrieve; reducing contents management risks and ensure that organisation is meeting regulatory requirements. ECM planning should be based on the "organisational goals and priorities" (Fanning, 2013; Salamntu and Seymour 2015:32). Kampffmeyer (2004) and Kampffmeyer (2006) also discussed ECM model in five categories of components and technologies and five traditional application areas as illustrated in Figure 2. The five categories are called capture, manage, store, deliver and preserve as also discussed in Kwatsha (2010); Svärd (2013:161). The traditional application areas includes Document management (DM), Collaboration (Collab), Web content management (WCM), Records management (RM) and Business process management (BPM)/workflow (Kampffmeyer, 2004; 2006).

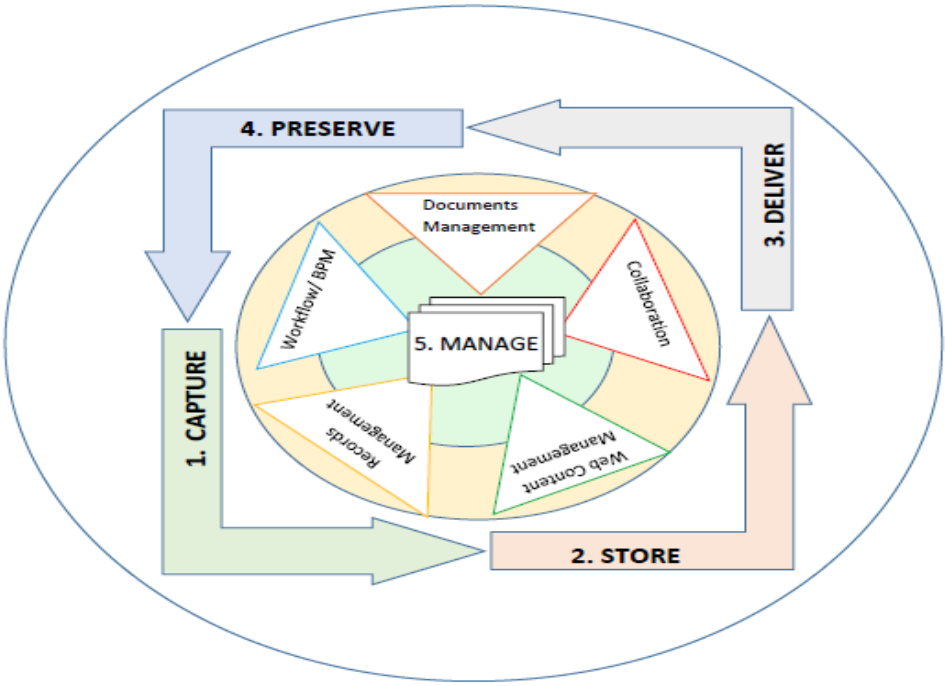

Figure 2: A typical illustration of the five categories of ECM components and technologies operations

Nevertheless, the capture category is about analog and electronic records generation, capturing, preparation and processing using automated classification at different levels of technology. It also includes content editing, indexing, review, approval, linking distribution, publication, use, update and retention (Kampffmeyer, 2006; Salamntu and Seymour 2015:32). The Manage category is applied for information management, processing and usage through administration databases and access control system (Kampffmeyer, 2006). In this regard ECM assist the organisation to manage content on the business process and functions (Salamntu and Seymour 2015:33). The category of Document Management entails documents control throughout the life span by means of system functionalities such as search and navigation, check-in/out, version management and visualization (Kampffmeyer, 2006; Hullavarad, O'Hare and Roy 2015:1). Collaboration is about "working together" including sharing of information database, joint processing of information, information and communication integration (Kampffmeyer, 2006; Hullavarad, O'Hare and Roy 2015:1). The Web Content Management entails information provided through the internet, extranet and portals using storage and access authorization functionalities (Kampffmeyer, 2006; Hullavarad, O'Hare and Roy 2015:1). Records Management is about overall records administration by means of among other activities file plan imagine, information indexing as guided by thesaurus, information protection and use of stored information metadata (Kampffmeyer, 2006). Workflow/ BPM are used for function connection, management and control (Kampffmeyer, 2006; Hullavarad, O'Hare and Roy 2015:4-5). Store component has to do with storage of content of non-archival value or short term value content

(Kampffmeyer, 2006; Hullavarad, O'Hare and Roy 2015:1-2). Preserve is a component of ECM that deals with archiving of long term value content since it provide safe storage with backup that is static and keep content unchanging and can also be used to temporarily keep short term value records (Kampffmeyer, 2006). The Deliver component function is to summaries and distributes the content to end users in a controllable manner as an output tool that uses transformation and security technologies (Kampffmeyer, 2006; Kampffmeyer, 2004).

Furthermore, ECM also covers content management strategies, methods and tools (AIIM, 2010; Katuu, 2012a; 2012b). Kampffmeyer (2006) stressed to support the above that "enterprise content management is just a transformation of existing technologies". According to Katuu (2012b) there are many modules that can be covered in the ECM applications as also listed above but that depend on the organisational business needs. The system need to be capable of centrally processing content through records management and archiving activities in such a manner that it will eventually be accessed and used in an authentic condition (Katuu 2012b). Kampffmeyer (2004) tabled among other benefits of ECM improving efficiency, managing risks, faster inquiries response, reduce costs and high revenue generation. In addition, Pelz-Sharpe et al. (2010) listed the following as the benefits of ECM to the organisation:

- Making an ever-increasing volumes of unstructured content (primarily documents) more accessible
- Reducing storage requirements by consolidating single sources of content
- Sharing and collaborating more effectively, and allow for reuse of existing corporate content
- Meeting legal and compliance requirements
- Reducing the amount of paper within the enterprise
- Providing a more standardized way of gathering and distributing information (e.g., using forms)
- Improving business processes to become more efficient
- Supporting business continuity requirements
- Increasing value from investments in content technologies
- Communicating in a more consistent manner with all stakeholders
- Supporting knowledge management strategies, and
- Fulfilling many other business purposes

However, in his summary and introduction, Katuu (2012b) underscore that "Organisations have a variety of business systems to help them manage their digital content" and that these contents are best managed using "network drives or other specialised business applications", unless they are not

managed. These contents are managed from different business systems attached to different business "functions and activities". For instance business system such as payroll and recruitment for Human resources and other systems for finance and marketing generate content that need to be properly managed. For the purpose of permanent preservation of long term value records "Digital curation system" is necessary. This is because other numerous business application systems may not be capable to keep the business contents for such a long period as required by the organisation. This implies that digital contents need to be transferred from ECM application to Digital curation system, which is a very challenging task (Katuu, 2012b; Hullavarad, O'Hare and Roy 2015:1; Svärd (2013:166).

Furthermore, the digital curation is about information professionals engaging in the management of digital content in such a manner that the content is retrievable and accessed over a long period of time despite technological changes. This implies that the business content is always provided in a condition expected and required by users due to its proper preservation. Digital repository is the central point of "digital curation activities" which range in size and may be classified according to "open source or proprietary system". The organisation need to be careful when deciding to use ECM applications such as EDMS and ERMS or since the applications may change over time or becomes incompatible due to different functional requirements. Alternatively organisation may use digital curation system to centrally import digital records from different applications (Katuu, 2012b).

Presentation and discussion of the findings

This section presents and discusses the findings of the study in relation to the literature reviewed.

The meaning of ECM

ECM is an acronym for Enterprise Content Management. According to the literature reviewed, it is a strategy that consists of a set of software products to manage all types of enterprise content throughout its entire life cycle (Bell, Shegda, Gilber and Chin, 2010; Katuu, 2012a; Hullavarad, O'Hare and Roy 2015:1). It is "the technologies used to capture, manage, store, preserve, and deliver content and documents related to organisational processes" (Fanning, 2013; Kampffmeyer, 2006) as also attests by Hullavarad, O'Hare and Roy (2015:1). ECM consists of a set of complex technologies integrated to function together with the purpose of ensuring improvement in managing organisational business content successfully. Successful ECM system implementation brings about business contents that are easy to access and retrieve, reduces contents management risks and ensures that the

organisation meets the regulatory requirements. ECM planning should be based on the organisational goals and priorities (Fanning, 2013). It is important to understand ECM in the organisation. The majority of employees in the healthcare institutions of Limpopo understand the meaning for the acronym ECM. Out of all the respondents, 12.9% (28) replied that ECM is a collaborative electronic system, and 24% (52) respondents said is the electronic system that integrates other business activities into the business process. The majority of respondents 63.1% (137) said it is a strategy that is made up with a set of software products to manage all types of enterprise content throughout its entire life cycle; and none of the respondents specified any other meaning. The report is fully illustrated by Figure 3.

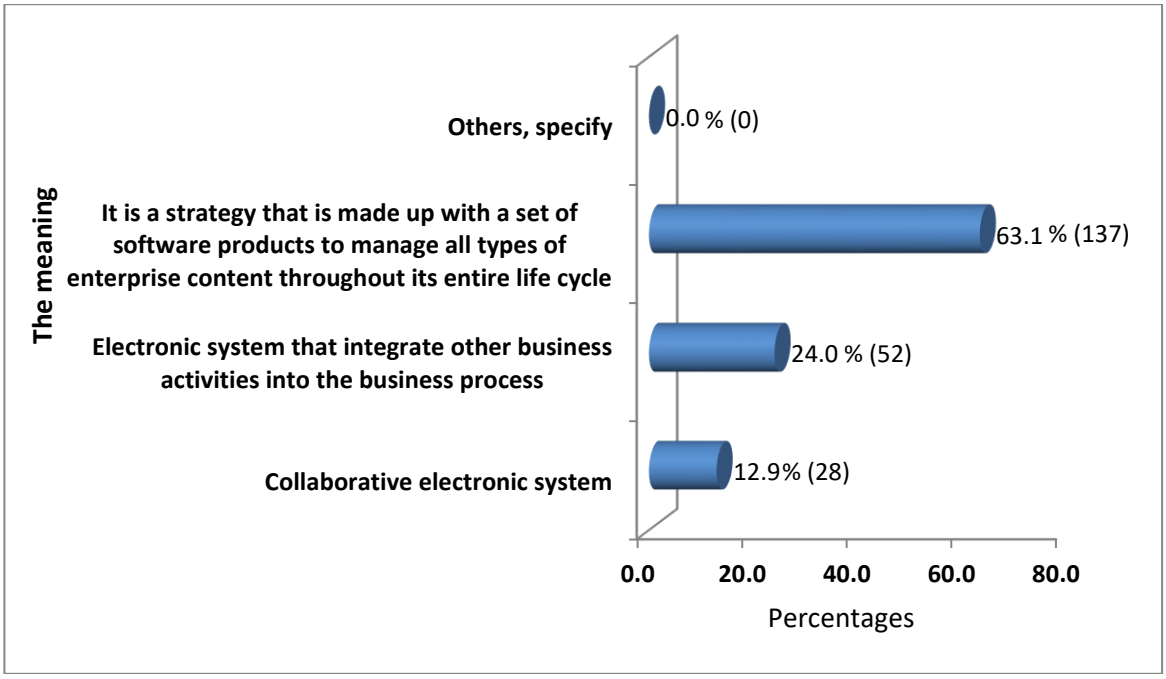

Figure 3: The meaning of ECM (N=217)

However, employees had little knowledge of the ECM indicators. The majority of respondents identified the indicators of ECM as migration of ERDMS to the web content (51.2% (111)) of respondents confirmed this. From the rest of the other respondents, 28.6% (62) said it is the introduction of improved add-ons such as web content management tools, e-mail integration and workflow/business process management to cover the application and development of EDRMS, 9.7% (21) said is a collective business processes management approach, 15.2% (33) said it covers many other components including knowledge management and no one specified other indicators. Table 1 illustrates the report in full.

Table 1: The indicators of ECM readiness (N=217)

INDICATORS OF ECM READINESS	**RESPONSES**	
	NUMBER	**PERCENTAGE**
• Migration of ERDMS to the web content	111	51.2
• The introduction of improved add-ons such as web content management tools, e-mail integration and workflow/business process management to cover the application and development of EDRMS	62	28.6
• A collective business processes management approach	21	9.7
• Covers many other components including knowledge management	33	15.2

The implementation of ECM as a modern e-records management system in the institution

The literature attests that the latest record management technology appears to be the ECM, after other electronic records management systems such as EDMS, ERMS, IDRMS or EDRMS (Katuu, 2012a; 2015; 2012b). As the latest system, ECM can assist healthcare service providers in minimising patient waiting time for the retrieval of records, because retrieval of records is done quickly by using a PC keyboard at the workstation with ECM. This promotes a good relation between the doctors and the patients (Weeks, 2013). However, the healthcare institutions have not yet started to implement ECM as a modern e-records management system, as confirmed by 83.4% (181) of respondents. Only few respondents (4.1% (9)) stated that ECM was implemented in their institutions while12.4% (27) did not respond. The only system used for medical records management was called PHIS or eHIS and not the ECM system that existed in the institution. This was also revealed by system analysis and observation.

The institutional readiness for the implementation of ECM

The literature reviewed underscores that there must be assurance that all aspects of ECM introduction are taken into consideration and addressed by applying a structured framework in planning, managing or operating an ECM IT infrastructure (Fanning, 2013). The institutions were ready for the implementation of ECM, as confirmed by 58.1% (126) of respondents. A full report is presented through Figure 4.

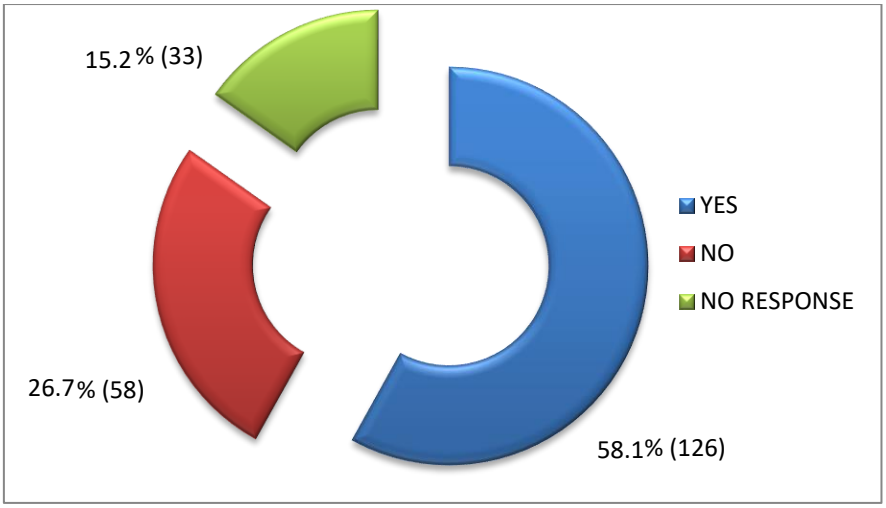

Figure 4: The institutions' readiness for the implementation of ECM (N=217)

Institutions had several computers at the patients' administrative helpdesks, but, in some institutions' consulting rooms, helpdesks and other stations, there were no computers. Furthermore, 75.1% (163) of respondents confirmed that the employees found the ECM necessary and relevant for the institution. Table 2 present a full report.

Table 2: ECM is necessary and relevant for the institution (N=217)

RESPONSES	NUMBER	PERCENTAGE
Yes	163	75.1
No	31	14.3
No response	23	10.6

The healthcare institutions feel that, if properly implemented, the ECM may bring improvement to the organisation in terms of:

- Easy retrieval of records (74.7% (162)),
- Electronic usage of records online (60.8% (132)),
- One record can be accessed by many people at the same time (68.7% (149)),
- Easy business continuity (57.1% (124)),
- Provision of timely, accurate, trustworthy and complete records (84.8% (184)),
- Effective records security throughout the life span (54.4% (118)),
- Access to quality data and information (60.8% (132)),
- Compliance with legislative framework (49.3% (107)), and
- Creation of reliable knowledge at all stages of the life span (37.3% (81)).

Availability of the electronic records management requirements for ECM system implementation

According to the literature reviewed, there are several key issues that need a very serious attention to address when intending to implement EMR system such as scope of work and timeframes, privacy and security, expenses, effectiveness in service provision, interoperability, patients clinicians interaction, competence and knowledge in system usage and change management to deal with resistance to change by users (Weeks, 2013; Boonstra and Broekhuis, 2010), lack of leadership, and interest by other officials to participate (Boonstra and Broekhuis, 2010). For instance, IT components required for the ECM system include, but are not limited to desktop/laptop/smart phone/tablet, network, internet, server/datacentre, cloud/software and skilled human resources (Fanning, 2013). These are ECM technical requirements to which the ECM will never be possible to implement without them and each have specific specification (Cornell University 2017). MoReq (2010:181) also refers to these as system non-functional requirements for scalability and further attest that "some systems are restricted by technical or other limitations such as database size, file system segmentation, single server utilisation, etc.". Respondents rated availability of relevant electronic records management requirements for effective implementation of the ECM system from very good to very poor, with the purpose of confirming the readiness as fully presented by Table 3. In the Limpopo healthcare institutions, availability of computers for records management was poor as confirmed by 45.2% (98) of respondents. It seems that there were several computers in almost all the hospitals, although they were not enough and some had outdated hardware and software. Availability of computer equipment such as printers was poor, as confirmed by 60.4% (131) of respondents. The printers were also available, but not enough and some resources, like toner, were not adequate.

Table 3: Rating of availability of the electronic records management requirements for effective implementation of ECM system (N=217)

ELECTRONIC RECORDS MANAGEMENT REQUIREMENTS FOR ECM	AVAILABILITY RATINGS									
	VERY GOOD		GOOD		UNSURE		POOR		VERY POOR	
	76-100%		51-75%				21-50%		Less than 25%	
	NO	%	NO	%	NO	%	NO	%	NO	%
1) Computers	12	5.5	31	14.3	4	1.8	98	45.2	72	33.2
2) Computer equipment, e.g. Printers	9	4.1	20	9.2	6	2.8	131	60.4	51	23.5
3) Servers	48	22.1	101	46.5	14	6.5	33	15.2	21	9.7

ELECTRONIC RECORDS MANAGEMENT REQUIREMENTS FOR ECM	AVAILABILITY RATINGS									
	VERY GOOD		GOOD		UNSURE		POOR		VERY POOR	
	76-100%		51-75%				21-50%		Less than 25%	
	NO	%	NO	%	NO	%	NO	%	NO	%
4) Networks	22	10.1	41	18.9	28	12.9	89	41.0	37	17.1
5) Internet connection	12	5.5	19	8.8	21	9.7	106	48.8	59	27.2
6) Internet website	44	20.3	82	37.8	8	3.7	57	26.3	26	12.0
7) Budget/funds	2	0.9	21	9.7	19	8.8	138	63.6	37	17.1

NOTE: NO = Number % = Percentage

Furthermore, the issues relating to availability of servers were good as rated by 46.5% (101) respondents. This is because each institution had at least one server for medical records management system, PHIS. Besides, the servers' capacity was not enough as they were down and freezing frequently. Availability of computer networks was poor, as confirmed by 41.0% (89) respondents. The network was inadequate because, in some institutions, not all computers were connected and some service points did not have network points. Nevertheless, the availability of an internet connection was poor, as confirmed by 48.8% (106) of respondents. The internet was not effective since it was frequently down and continuously processing slow. According to the website analysis, the website looks to be well designed and well structured, but the information and structure of the website seem to be centralised at the provincial Department of Health and there are no links to promote the institutions and their services. Instead, the website just listed the names of the institutions with the contact details and addresses. The website was down, freezing and responding slow frequently during browsing and documents downloading. However, the biggest problem of all was that budget availability was poor, as confirmed by 63.6% (138). A full report is presented through Table 4 above.

Responsible person for implementation of ECM

The literature proves that the project key role players or champions need to be identified, and communication needs to be strengthened as a key factor (Fanning, 2013). In the Limpopo healthcare institutions, the most relevantly responsible persons identified for implementation of the ECM were confirmed to be the records manager, chief executive officer and the head of department. This was confirmed by 50.2% (109), 88% (191) and 93.1% (202) of respondents, respectively. A detailed report is presented through Figure 5.

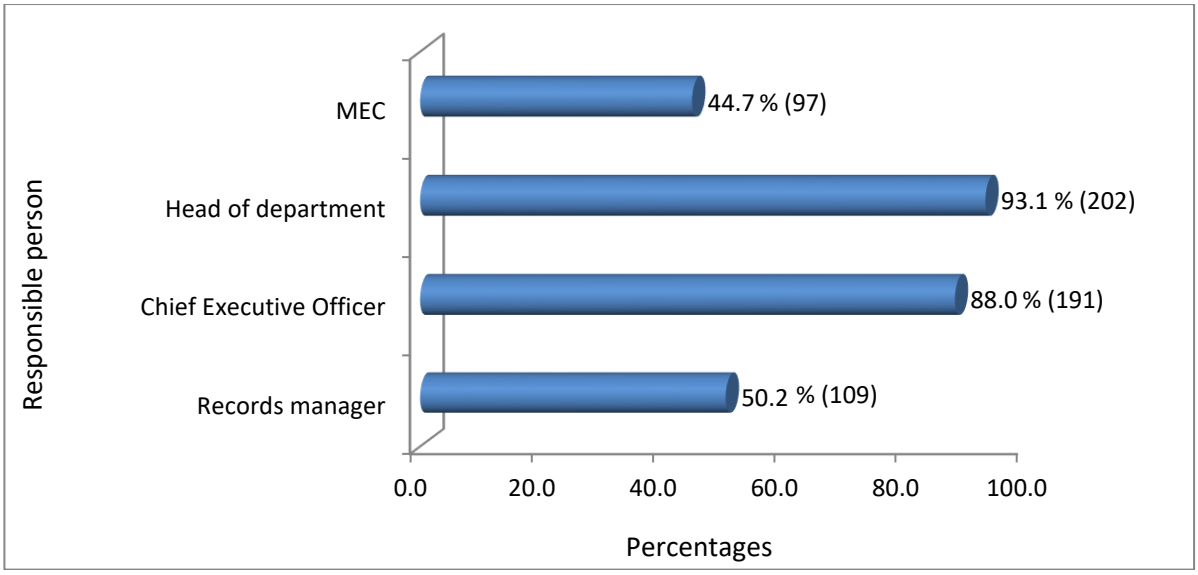

Figure 5: Responsible person for implementation of ECM (N=217)

Conclusion and recommendations

Even though Foley (2014); Nguyen et al.(2009) discovered in their studies that electronic records and document management system are always failing services in the organizations due to several reasons but O'Donnell (2015) discovered that it is a very useful tool to improve records management function in the organization though certain challenges need attention. O'Donnell (2015:29) argue that records workers need a support and we need to consider information revolution and move to a new kind of digital workspace from time to time. The practice of information management need to be changed as the new technology also evolve and which means our ways of storing and retrieving records in the past must change in accordance with technology of today. O'Donnell (2015:30) further listed factors that need attention for improvement and avoidance of system implementation failure such as data growth, mobility, social media, information silos, EDRMS failure, productivity loss, privacy breaches and eDiscovery costs. Nguyen et al. (2009) underscore that "top management support, good recordkeeping awareness and practice, early development of Business Classification Schemes (File Plan/Thesaurus), adequate and on-going training and support; and well-prepared change management strategies are the keys to success in developing enterprise wide electronic records management solutions". As such the organisation need to bear those factors in mind in case they opt for adoption of any electronic system. A successful system implementation need a good records management practice and staff awareness of the importance of proper records management (Nguyen et al. 2009)

It is advisable for the department of health in Limpopo to consider several factors including those mentioned by Nguyen et al. (2009) to avoid failure in implementing electronic system. These are

provision of “adequate training and ongoing support, top management support, staff recordkeeping awareness and practice, change management, project management, implementation team makeup, business vision and plan, system performance monitor and management; and File Plan development”. The healthcare institutions have the advantage that they can implement the ECM system with ease as employees understand it and its indicators. The healthcare institution, through the provincial Department of Health, must improve and fully implement their PHIS system in collaboration with the ECM. The other advantage or opportunity for the institutions to implement ECM is that they already have several computers, basic network lines, printers, servers and other related IT requirements that can be used as a start. The institutions need to purchase and add more of these resources to ensure effective implementation of the system without many barriers.

It also depends on the support and interest of the provincial health department to carry responsibility for supporting the institutions with adequate budget and other resources like sufficient and qualified officials. The healthcare institutions must implement ECM as it is necessary and relevant for the management of records and information in the institution to bring improvement in terms of, among others:

- Easy retrieval of records,
- Electronic usage of records online,
- One record accessed by many people at the same time,
- Easy business continuity,
- Provision of timely, accurate, trustworthy and complete records,
- Effective records security throughout the life span,
- Access to quality data and information,
- Compliance with legislative framework, and
- Creation of reliable knowledge at all stages of the life span.

Furthermore, the institutions must conduct a feasibility study to identify the number of computers, printers, server capacity, network lines and points, internet connectivity requirements and the kinds of information to share through the site with clients and employees. After the feasibility study, they must cost all the required resources for the system before implementation to ensure successful implementation of the system. The records manager must, in his endeavour for ECM implementation, get in the support of management, the CEO and the head of the Department of Health, as well as the political will. This will instead avoid cases of the website just listing the names of the institutions with the contact details and addresses, rather than also presenting or promoting services of the institutions and news about the job they are doing, healthcare guidance and many more. The institutions must also

deal with the issue of website downtime, freezing and slow response during browsing and documents downloading, especially during normal working hours to avoid healthcare service delay.

> Transitioning to an ECM can help an organization improve customer service, streamline processes, enhance employee productivity, track information, and comply with regulations, eliminate unneeded information on servers and in filing cabinets, and implement business continuity measures. The main goal of ECM implementation is to have transparent content sharing by making different and incongruent applications (for example, web content management, and records management) interoperable. One of the important considerations before implementing an ECM system is to clearly identify the needs, type of organization culture, data type and other Enterprise Resource Planning systems that ECM would be integrated with. The described strategic value of ECM includes increasing decision making capabilities, facilitating creativity, and enhancing the professional representation of the enterprise in the eyes of its stakeholders (Hullavarad, O'Hare and Roy 2015:1).

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